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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,036	10/25/2005	Toru Okabe	P/2850-102	2806

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EXAMINER	
ZHU, WEIPING	
ART UNIT	PAPER NUMBER
1734	

MAIL DATE	DELIVERY MODE
01/04/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/517,036	OKABE ET AL.	
	Examiner	Art Unit	
	WEIPING ZHU	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 April 2010 and 02 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,8-15 and 18-21* is/are pending in the application.

4a) Of the above claim(s) *12-15* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 8-11 and 18-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on April 30, 2010 has been entered.

Status of Claims

2. Claims 1, 8-11 and 18-21 are currently under examination wherein claims 1 and 21 have been amended in applicant's amendment filed on April 2nd, 2010.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 8-11 and 18-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Löffelholz et al. (US 6,136,062) in view of Takahar et al. (US 5,417,917) and further in view of Kamei et al. (US 6,015,527).

With respect to claims 1, 8, 9, 11 and 21, Löffelholz et al. ('062) discloses a method for producing niobium and/or tantalum powders by reducing the metal compounds with an active metal (e.g. alkaline earth metals and/or rare earth metals) as

a reducing agent (col. 1, lines 34-38). Löffelholz et al. ('062) further discloses that niobium oxide and tantalum oxide can be reduced (col. 1, lines 60-61); the preferred reducing metals are magnesium, calcium, lanthanum and cerium, magnesium is particularly preferred (col. 1, lines 62-65); the reducing temperature is between 750 and 850° C (col. 1, lines 49-59), which is within the claimed reducing temperature; the reduction product is separated from alkaline earth oxides and /or rare earth oxides formed in the reduction and from excess alkaline earth metal and/or rare earth metal by acid washing (col. 1, lines 42-47).

Löffelholz et al. ('062) does not disclose the claimed features in the mixing, molding and sintering steps.

Takahar et al. ('917) discloses a method for producing a metallic porous membrane comprising: mixing a powdery metal compound with a binder; molding the mixture to a desired shape; and sintering the compact to produce a sintered metal compound compact followed by a reducing step to reduce the compact to a metallic porous membrane by a reducing gas (col. 3, lines 46-68).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to mix a powdery metal compound with a binder; mold the mixture to a desired shape; sinter it to a sintered compact; and reduce the compact by a reducing agent in a gaseous form as disclosed by Takahar et al. ('917) in the process of Löffelholz et al. ('062) in order to improve the quality of the final product and be well feasible to the industrial practice as disclosed by Takahar et al. ('917) (col. 4, lines 1-7).

Löffelholz et al. ('062) in view of Takahar et al. ('917) does not teach the mixture comprises a compound as claimed.

Kamei et al. ('527) discloses a method for producing reduced iron comprising mixing a metal compound, a powdery solid reductant, some amounts of water or a binder comprising tar, organic resin, cement, slag, surface-active agent or the like and compacting the mixture in a sheet-like shape (col. 2, lines 61-65, col. 8, lines 29-34 and 62-65). The binders as disclosed by Kamei et al. ('527) (e.g. slag which would include magnesium oxide) would read on the claimed at least one compound excluding bentonites and dolomites, selected from the group consisting of oxides of Mg, Na, Ba and K; halides of Ca, Mg, Na, Ba, and K; and carbonates of Na, Ba and K.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to mix a powdery metal compound and an amount of a binder (e.g. slag) together for molding in the process of Löffelholz et al. ('062) in view of Takahar et al. ('917) in order to facilitate uniform and rapid mixing, and furthermore the formation of the compacts as disclosed by Kamei et al. ('527) (col. 8, lines 29-34 and 62-65).

Löffelholz et al. ('062) in view of Takahar et al. ('917) and further in view of Kamei et al. ('527) discloses reducing the sintered compact of desired form by a reducing agent in a gaseous form (i.e. the vapor of the active metal as claimed) as discussed above, which reads on the claimed reducing step of supplying a vaporized active metal to the metal compound compacts. Löffelholz et al. ('062) in view of Takahar et al. ('917) and further in view of Kamei et al. ('527) does not specify the manner of the arrangement of the metal compound compacts as claimed. However, it would have

been obvious to one of ordinary skill in the art at the time the invention was made to arrange the compacts in the claimed manner in order to reduce the compacts of Löffelholz et al. ('062) in view of Takahar et al. ('917) and further in view of Kamei et al. ('527) by a vaporized active metal effectively and uniformly. The extent of the shape change of the compacts of Löffelholz et al. ('062) in view of Takahar et al. ('917) and further in view of Kamei et al. ('527) before and after the reducing step would be substantially identical to the claimed extent, because the processes of Löffelholz et al. ('062) in view of Takahar et al. ('917) and further in view of Kamei et al. ('527) and the instant application are substantially identical, and are performed upon substantially identical products. See MPEP 2112.01.

Löffelholz et al. ('062) in view of Takahar et al. ('917) and further in view of Kamei et al. ('527) does not specify the mixing ratio of the compound as claimed. However, it is well held that discovering an optimum value of a result-effective variable involves only routine skill in the art. In re Boesch, 617, F.2d 272, 205 USPQ 215 (CCPA 1980). In the instant case, mixing ratio of the compound is a result-effective variable, because it would directly affect the uniformity of the mixture as disclosed by Kamei et al. ('527) (col. 2, lines 61-65 and col. 8, lines 29-34). It would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the mixing ratio of the compound of Löffelholz et al. ('062) in view of Takahar et al. ('917) and further in view of Kamei et al. ('527) for the desired uniformity of the powdery mixture. See MPEP 2144.05 II.

With respect to claim 10, Takahar et al. ('917) discloses the mixture is molded to a shape of 70 mm in diameter and about 2 mm thick (col. 1, lines 48-50). The distance from an arbitrary location within the compact to the surface is 1 mm, which overlaps the claimed distance range of 2 to 5 mm.

With respect to claim 18, this claim is rejected for the same reason as instant claim 10 as discussed above. Furthermore, it is well settled that merely changing the size of an article is not a matter of invention. See MPEP 2144.04 IV.

With respect to claim 19, Takahar et al. ('917) discloses that the mixing ratio of metal compound in the metal compound compact is not less than 10% by weight (col. 3, lines 46-51), which is the same as the claimed range.

With respect to claim 20, Löffelholz et al. ('062) discloses that 480 g of Mg melt is mixed with 350 g of the metal compound to reduce the metal compound (Example 1, Table 1), which overlaps the claimed range.

Response to Arguments

4. The applicant's arguments filed on April 2nd, 2010 have been fully considered but they are not persuasive.

First, the applicant argues that Kamei et al. ('527) does not teach the instantly claimed compounds. In response, the examiner notes that the binders as disclosed by Kamei et al. ('527) (e.g. slag which would include magnesium oxide) read on the claimed at least one compound excluding bentonites and dolomites, selected from the group consisting of oxides of Mg, Na, Ba and K; halides of Ca, Mg, Na, Ba, and K; and carbonates of Na, Ba and K as discussed above.

Second, the applicant argues that the range of the ratio disclosed by Kamei et al. ('527) is well outside the instantly claimed ratio range. In response, the examiner notes that it appears that Kamei et al. ('527)'s range of the ratio calculated by the applicant is only applicable to using bentonite as the compound in a powdery mixture comprising iron compounds. It would have been obvious to one of ordinary skill in the art that the optimum ratio using slag as the compound in a powdery mixture comprising niobium compounds would be different. The rejection of the instantly claimed ratios on the ground of the ratio being a result-effective variable as stated above is proper and therefore maintained.

Third, the applicant argues that Kamei et al. ('527)'s range of the ratio calculated by the applicant is optimized for the specific purpose of facilitating uniform and rapid mixing and is accordingly unrelated to the instantly claimed optimized ratio range for uniform metal powder formation; and optimization is not appropriate here based on the cited art when different purposes and results are sought. In response, the examiner notes that the reason for optimizing the mixing ratio of the compounds for Kamei et al. ('527) does not have to be the same as that of the instant invention. See MPEP 2144 [R-5]. Furthermore, it is noted that the specific purpose of facilitating uniform and rapid mixing of the powdery metal compounds as disclosed by Kamei et al. ('527) is directly related to the instant invention's purpose of uniform metal powder formation because it would be obvious to one of ordinary skill in the art that a uniform metal powder formation would depend on the uniformity of the powdery mixture before the molding and the reduction steps.

Fourth, the applicant argues that unexpected effects of instantly claimed ratio range of the compounds in terms of the particle size distribution would not have been obvious. In response, see examiner's responses to applicant's arguments above. It is noted that no such effects are recited in the instant claims. Furthermore, Löffelholz et al. ('062) in view of Takahar et al. ('917) and further in view of Kamei et al. ('527) meets all the claimed limitation as discussed above. The same effects of adding optimized ratios of the compounds would be achieved in the process of Löffelholz et al. ('062) in view of Takahar et al. ('917) and further in view of Kamei et al. ('527) as in the instantly claimed process, because the prior art process appears to be substantially the same, and performed under substantially the same conditions as the claimed process.

Conclusions

5. This Office action is made non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Weiping Zhu whose telephone number is 571-272-6725. The examiner can normally be reached on 8:30-16:30 Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emily Le can be reached on 571-272-0903. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Weiping Zhu/
Examiner, Art Unit 1734

1/2/2011